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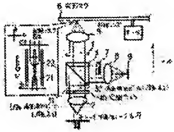
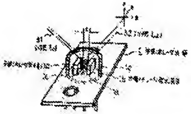
(54) **OPTICAL HEAD**

(57)Abstract:





PURPOSE: To prevent a signal from being left unerased and to immediately rewrite the signal, by arranging a spatial filter having an aperture smaller than the aperture diameter of an objective lens almost in the center of a mirror plane having a wave selectivity between a semiconductor laser beam source and the objective lens.

CONSTITUTION: Two semiconductor laser beam emitting elements 1a and 1b are confronted with each other adjacently on the same flat plate, and fixed via a pedestal, and they can be lit independently. Also, by setting a light beam out of incident light beams on the spatial filter 40 from the semiconductor laser beam source 1 so as to transmit a recording and reproducing beam 31 on a mirror surface and to reflect an erasing light beam 32, all of the recording and reproducing light beams transmit the spatial filter 40, however, only an incident part of the erasing light beam 32 on the aperture transmits the spatial filter 40. Therefore, it is possible to set only the light flux diameter of the erasing light beam 32 smaller than the aperture diameter of the objective lens 5. In such a way, it is possible to prevent the signal from being left unerased, and to rewrite the signal immediately.

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審査請求　未請求　発明の数　1　（全10頁）

㉞発明の名称　光ヘッド

㉑特　願　昭62-216479
㉒出　願　昭62(1987)9月1日

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明　細　書

1. 発明の名称

光ヘッド

2. 特許請求の範囲

1. 情報記録円盤に信号を光学的に記録すると共に、記録された該信号を光学的に再生及び消去する光ヘッドにおいて、

互いに波長の異なる記録・再生用の第1の光ビームと消去用の第2の光ビームとをそれぞれ発生する少なくとも2個の半導体レーザ発光素子を、近接して同一平板上に配して固定して成る半導体レーザ光源と、前記各半導体レーザ発光素子から発生した第1及び第2の光ビームを前記情報記録円盤上の互いに近接した位置に2つの光スポットとして照射させる対物レンズと、照射された前記第1及び第2の光ビームの前記情報記録円盤からの反射光のうちで少なくとも第1の光ビームの反射光を、前記半導体レーザ光源と情報記録円盤とを結ぶ光路から分離する光ビーム分離手段と、を少なくとも具備し、少なくとも前記第1の光ビームは透過（または反射）し前記第2の光ビームは反射（または透過）する波長選択性を有するミラー面の略中心に、該第1及び第2の光ビームを透過（または反射）し、少なくとも前記情報記録円盤の半径方向に対応する長さが前記対物レンズの開口径よりも小さい領域を有して成る空間フイルタを、前記半導体レーザ光源と対物レンズとの間の光路中に設け、該半導体レーザ光源から該空間フイルタに入射した前記第1及び第2の光ビームのうち、少なくとも該空間フイルタを透過（または反射）した光ビームが前記対物レンズに入射するように配置したことを特徴とする光ヘッド。

2. 特許請求の範囲第1項に記載の光ヘッドにおいて、前記半導体レーザ光源における前記第1及び第2の光ビームをそれぞれ発生する少なくとも2個の半導体レーザ発光素子は第1及び第2の半導体レーザ発光素子から成り、該第1及び第2の半導体レーザ発光素子は、前記平板上において、互いに、その接合面に立てた各

ビーム３１の全光束と空間フイルタ４０の開口４２に入射した光ビーム３２の中心部３２ａは、空間フイルタ４０を透過し、立ち上げミラー１５の反射面で反射する。一方、空間フイルタ４０の波長選択性ミラー面４１に入射した光ビーム３２の外周部３２ｂは、波長選択性ミラー面４１で反射される。この時、波長選択性ミラー面４１は立ち上げミラー１５の反射面に対して若干傾斜しているから、光ビーム３２ｂは光ビーム３１および３２ａに対して光デイスクの円周方向（ｙ軸方向）に若干傾むいて反射される。

この結果、光デイスク６の記録トラック６ａ上には、第１２図に示すように、記録再生用光ビーム３１から形成された記録再生用光スポット２１と、消去用光ビーム３２ａから形成されたスポット径の大きな消去用光スポット２２ａと、それに隣接して、消去用光ビーム３２ｂから形成され、スポット径が小さくかつ端部の円環部の強度が大きい光スポット２２ｂと、がそれぞれ照射される。従つて、消去時は、この消去用光スポット２２ａ

と２２ｂが共に強い光強度で記録トラック６ａを照射し、昇温徐冷効果によつて消去を行う。

本実施例のような構成をとる事によつて、消去用光ビームの光量損失を無くし、効率のよい消去を行う事ができる。

第１３図は本発明の第６の実施例の構成を模式的に示した断面図である。

第１３図において、既に述べた実施例と同一の構成部品には同一の符号を付した。

本実施例では、空間フイルタ４０′は、第１４図に示すように波長選択性ミラー面４３と全反射ミラー面４４からなる。波長選択性ミラー面４３は、既に述べた実施例と異なり、第１５図に示すように記録・再生用光ビーム３１の波長 λ_1 で反射率が高く、消去用光ビーム３２の波長 λ_2 で反射率が低くなつている。

従つて、空間フイルタ４０′を用いる事によつて、記録・再生用光ビーム３１は全光束が反射され、消去用光ビーム３２は全反射ミラー面４４に入射した光束の中心部のみが反射されるので、全

反射ミラー面４４の面積を適当な大きさにする事により、消去用光ビーム３２の光束径を任意の径に縮小でき、その結果、消去用光スポット２２のスポット径を拡大することができる。

このように空間フイルタ４０を反射型で用いる事により、光路を曲げながら消去用光ビーム３２の光束径の縮小が行なえる。従つて、空間フイルタ４０を立ち上げミラーや光路変更用ミラーと兼用させる事が可能であり、部品点数の削減が図れる。

〔発明の効果〕

本発明によれば、従来の記録専用の１レーザ光ヘッドと略同程度の簡単な構成にて、消去用光スポットのスポット径を記録ピットよりも充分大きくして信号の消し残りを防止できると共に、信号の即時書き換えも可能となる。

また、記録・再生用光ビームと消去用光ビームは、同一平板上に近接して配置され固定された２つ以上の半導体レーザ発光素子から成る１つの半導体レーザ光源から発せられ、同一の光学系を経

て光デイスク上に照射されるので、熱，振動などの影響によつて発生する各光スポットの相対的位置ずれを抑え、高い照射位置安定性を得ることができる。

４．図面の簡単な説明

第１図は本発明の第１の実施例の構成を模式的に示した断面図、第１Ａ図は第１図における光デイスク面の要部拡大図、第２図は第１図における半導体レーザ光源を一部破断して示した斜視図、第３図は第１図における空間フイルタの構成を示す斜視図、第４図は第３図における波長選択性ミラー面の反射率の波長依存性を示すグラフ、第５図は第１図における対物レンズに入射する各光ビームの光束径と光スポットのスポット径との関係を説明するための説明図、第６図は空間フイルタの開口の形状が第５図とは異なる場合の、各光ビームの光束径と光スポットのスポット径との関係を説明するための説明図、第７図は本発明の第２の実施例の構成を模式的に示した断面図、第８図は本発明の第３の実施例の構成を模式的に示した

断面図、第9図は本発明の第4の実施例の構成を模式的に示した断面図、第10図は本発明の第5の実施例の構成を模式的に示した断面図、第10A図は第10図における光ディスク面の要部拡大図、第11図は第10図における立ち上げミラー及び空間フィルタの構成を示す斜視図、第12図は第10A図における記録トラック6a上の光強度を示した説明図、第13図は本発明の第6の実施例の構成を模式的に示した断面図、第14図は第13図における空間フィルタの構成を示す斜視図、第15図は第14図における波長選択性ミラー面の反射率の波長依存性を示すグラフ、である。

符号の説明

1……半導体レーザ光源、1a，1b……半導体レーザ発光素子、3……偏光ビームスプリッタ、5……対物レンズ、6……光ディスク、21……記録・再生用光スポット、22……消去用光スポット、31……記録・再生用光ビーム、32……消去用光ビーム、40，40′……空間フィルタ、41，43……波長選択性ミラー面、42……開

口、44……全反射ミラー面。

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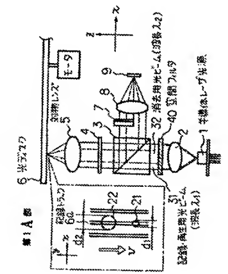
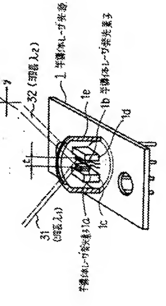
第1図

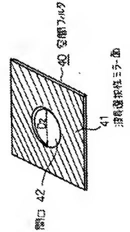
第1A図



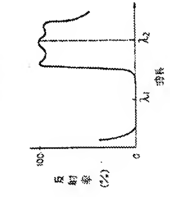
第2図



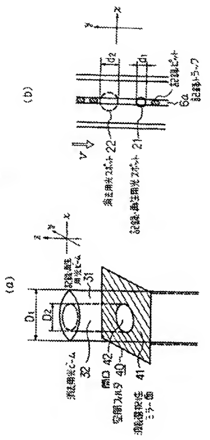
第 3 図



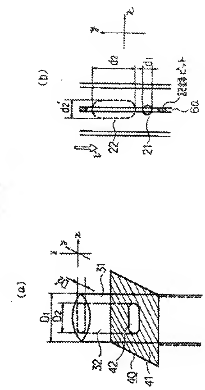
第 4 図



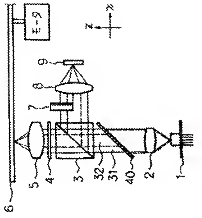
第 5 図



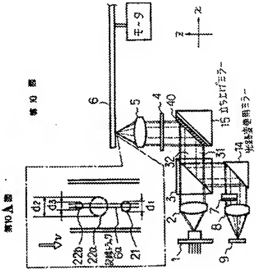
第 6 図



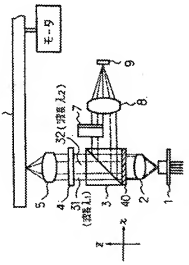
第9図



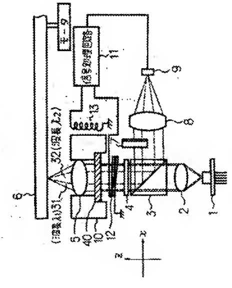
第10図



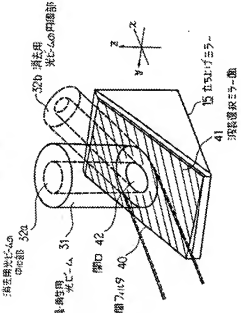
第7図



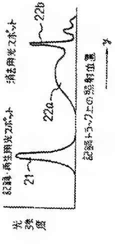
第8図



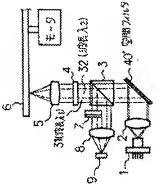
第11図



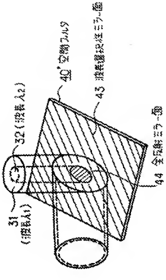
第12図



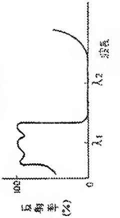
第13図



第14図



第15図



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* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1]Optical HETSUDO which a signal is optically recorded on an information storage disk characterized by comprising the following, and reproduces and eliminates this recorded signal optically.
A semiconductor laser light source which approaches, allots at least two semiconductor laser light emitting devices which generate the 1st optical beam for record / reproduction that differs in wavelength mutually, and the 2nd optical beam for elimination, respectively on monotonous [same], and is fixed.
An object lens which a position which approached mutually on said information storage disk is made to irradiate with the 1st and 2nd optical beams generated from said each semiconductor laser light emitting device as two light spot.
Optical beam separating mechanism which separates catoptric light of the 1st optical beam from an optical path which ties said semiconductor laser light source and an information storage disk at least among catoptric light from said information storage disk of said 1st and 2nd irradiated optical beams.
Wavelength selectivity which possesses at least, and penetrates said 1st optical beam at least (or reflection), and said 2nd optical beam reflects (or penetration).

[Claim 2]In optical HETSUDO given in the 1st paragraph of a range of an application for patent, at least two semiconductor laser light emitting devices which generate said 1st and 2nd optical beams in said semiconductor laser light source, respectively comprise the 1st and 2nd semiconductor laser light emitting devices, this -- on [said] monotonous, the 1st and 2nd semiconductor laser light emitting devices of each altitude stood to the plane of composition abbreviated-correspond mutually -- and -- this -- the 1st and 2nd semiconductor laser light emitting devices with the 1st and 2nd pedestals allocated respectively. Optical HETSUDO which being arranged face to face and fixing to an abbreviated symmetric position to a predetermined base level parallel to an optic axis of said 1st and 2nd optical beams.
[Claim 3]Optical HETSUDO, wherein said spatial filter is allocated in optical HETSUDO given in the 1st paragraph of a range of an application for patent on [of said optical beam separating mechanism allotted into an optical path between said semiconductor laser light source and an object lens] a predetermined optical surface.
[Claim 4]Optical HETSUDO to which said spatial filter at least is characterized by this object lens, one, and carrying out an intermediary drive when said object lens drives by tracking control in optical HETSUDO of a statement in the 1st paragraph of a range of an application for patent.
[Claim 5]Optical HETSUDO, wherein said spatial filter is allocated in optical HETSUDO given in the 1st paragraph of a range of an application for patent on [of a total reflection mirror for optical path changes allotted into an optical path between said semiconductor laser light source and an object lens] a reflector.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[Industrial Application]
About optical HETSUDO used in optical information storage playback equipment etc., especially, this invention records a signal on an information storage disk (it is hereafter described as an optical disc.), and relates to suitable optical HETSUDO to play and eliminate this recorded signal.
[Description of the Prior Art]
In eliminable optical HETSUDO in the former, when eliminating the signal recorded on the optical disc, in order to erase and to prevent the remainder, it is necessary to make the size of the spot diameter of the light spot for elimination larger enough than record PITSUTO width. However, in order to realize this, supposing it provides a desired optical system in optical HETSUDO, there is a problem that the part mark of optical HETSUDO will increase.
Then, as opposed to such a problem in JP,61-206926,A. A semiconductor laser array with two emission points independent of the position which approached extremely is used as a light source, Two optical beams from this semiconductor laser array mostly on a recording track in the same position. An optical disc is radially located in a line as two light spot, arrange this semiconductor laser array so that it may glare, and at the time of record or playback. Only one optical beam is *****ed, record or reproduction is performed, and composition which eliminates record PITSUTO above the width of a record pit sequence is described by by ****ing two optical beams simultaneously at the time of elimination.
[Problem(s) to be Solved by the Invention]
however, two optical beams which became independent in the above-mentioned proposed example -- the same recording track top -- it being necessary to make the same position irradiate mostly, and. Since reservation of the positioning and stability has a big problem, and also the optical beam for record / reproduction shifts a little and is irradiated to record PITSUTO at the time of record or reproduction, when record and reproduction performance deteriorate, ****** is ****** when.
By the way, in recent years, there is a request of rewriting the instancy which performs record and elimination of a signal at the time mostly. However, so that the light spot of the optical beam for record and the light spot of the optical beam for elimination may approach simultaneously and may be located on the same recording track of an optical disc, in order to perform this, The optical beam for record and the optical beam for elimination are respectively generated from a separate light source, and it is necessary to have composition which can carry out intensity modulation independently (still more generally, the light source which generates the optical beam for record is also a light source which generates the optical beam for reproduction, and is shared by record and reproduction.). For this reason, the composition which carries two or more semiconductor laser light sources by eliminable optical HETSUDO conventionally is common, and it is ******. However, the problem that optical HETSUDO will be inevitably enlarged and complicated in such composition is ******.
The instancy which could not record a signal almost simultaneously with elimination, therefore was described above since the simultaneous light of the two optical beams had to be carried out in the proposed example mentioned above when eliminating, it is impossible and rewriting is ******.
The purpose of this invention is to provide optical HETSUDO which solves the problem of the above-mentioned conventional technology, the spot diameter of the light spot for elimination is made larger enough than record BITSUTO, and a signal erases with easy composition, and prevents the remainder, and enables instant rewriting of a signal.
[Means for Solving the Problem]
To achieve the above objects, in this invention, use a semiconductor laser light source which approaches, allots two semiconductor laser light emitting devices which emit an optical beam of mutually different wavelength on monotonous [same], and is fixed as a light source, and. At for example, the abbreviated center of a mirror surface that an optical beam of one wavelength penetrates and an optical beam of wavelength of another side has the wavelength selectivity to reflect. Length

corresponding to a radial direction of an optical disc allocated a spatial filter which has an opening smaller than an opening diameter of an object lens into an optical path between said semiconductor laser light source and an object lens.
[Function]
On monotonous [same], said two semiconductor laser light emitting devices keep the distance of about tens of micrometers mutually, counter, are arranged, and are being respectively fixed via the pedestal.
It can be made to **** independently respectively.
Therefore, the position approached on the same recording track of an optical disc in the light spot for record / playback and the spot for elimination with the composition of the approximately said appearance as conventional 1 laser-beam HETSUDO can be made to irradiate independently respectively, and instant rewriting of a signal is attained.
If the optical beam for record / reproduction is penetrated and it is made to reflect the optical beam for elimination in said mirror surface among the optical beams which enter into said spatial filter from said semiconductor laser light source, the optical beam for record / reproduction will penetrate these all spatial filters, but. Only that by which the optical beam for elimination entered into said opening penetrates this spatial filter. Therefore, only the luminous flux diameter of the optical beam for elimination can be selectively made smaller than the opening diameter of said object lens.
By the way, when the luminous flux diameter of the optical beam which enters into an object lens is smaller than the opening diameter of an object lens, the spot diameter of the light spot irradiated by the optical disc is inversely proportional to the luminous flux diameter of an optical beam. Therefore, since the light spot for elimination is inversely proportional to it and becomes larger enough than record PITSUTO width by making only the luminous flux diameter of the optical beam for elimination reduce selectively with said spatial filter like the above, a signal can erase and the remainder can be prevented.
[Example]
Hereafter, Drawing 1 explains the 1st example of this invention.
Drawing 1 is a sectional view showing typically the composition of optical HETSUDO as the 1st example of this invention. the --A [1] figure is an important section enlarged drawing of the optical disc surface in Drawing 1.
in Drawing 1 -- 1 -- a semiconductor laser light source and 2 -- a collimate lens and 3 -- a polarization beam splitter (it is hereafter described as PBS.), and 4 -- 1/4 wavelength plate and 5 -- an object lens and 6 -- an optical disc and 7 -- the Hukou prism and 8 -- a detection lens and 9 -- a hyperfractionation photodetector and 40 -- a spatial filter -- it comes out. the -- inA [1] figure, the arrow v shows the hand of cut of the optical disc 6.
Drawing 2 is a perspective view fracturing and showing a part of semiconductor laser light source in Drawing 1.
As shown in Drawing 2, the semiconductor laser light source 1 counters in the same case 1e, and arranges the two semiconductor laser light emitting devices 1a and 1b and the pedestals 1c and 1d which emit light independently respectively in the laser beam from which wavelength differs mutually. By such a placed opposite, the interval t of the emission point of the semiconductor laser light emitting devices 1d and 1b can be about tens of micrometers.
As shown in Drawing 1, the optical beam 31 (solid line) for record / reproduction of wavelength lambda1 and the optical beam 32 (dashed line) for elimination of wavelength lambda2 which were generated from the semiconductor laser light source 1, After both being changed into a parallel optical beam by the collimate lens 2 which amended the chromatic aberration to the light of the wavelength of lambda1 and lambda2 at least, the spatial filter 40 is reached.
the graph which shows the wavelength dependency of the reflectance of the wavelength selectivity mirror surface 41 where Drawing 3 is a perspective view showing the composition of the spatial filter 40 in Drawing 1, and Drawing 4 constitutes the spatial filter 40 of Drawing 3 -- it comes out.
As shown in Drawing 3, the spatial filter 40 comprises the wavelength selectivity mirror surface 41 which has the reflectance of about 100% by wavelength lambda2 of the optical beam 32 for elimination, and the circle die opening mouth 42 provided in the abbreviated central part about 0% by wavelength lambda1 of the optical beam 31 for record / reproduction like Drawing 4. Intermediary **** in which opening

diameter D2 of the circle die opening mouth 42 is smaller than the opening diameter of the object lens 5.
If the optical beams 31 and 32 enter into such a spatial filter 40, since the optical beam 31 for record / reproduction of wavelength lambda1 penetrates the wavelength selectivity mirror surface 41 as it is, it will not change luminous flux diameter D1 of the optical beam 31 after passage of the spatial filter 40 at all to before incidence. On the other hand, since the optical beam 32 for elimination of wavelength lambda2 will be reflected in the wavelength selectivity mirror surface 41, only the light flux which entered into the circle die opening mouth 42 passes the spatial filter 40. Therefore, the luminous flux diameter of the optical beam 32 for elimination after spatial filter 40 passage is reduced to D2.
Next, the optical beams 31 and 32 which passed the spatial filter 40, pass the PBS3, 1/4 wavelength plate 4 -- being narrowed down with the object lens 5 -- the -- as shown inA [1] figure, the light spot 21 for record / playback and the light spot 22 for elimination are formed in the position which approached mutually on the recording track 6a of the optical disc 6, respectively.
Each optical beam which reflected the optical disc 6, Again, it passes through the object lens 5 and the 1/4 wavelength plate 4, it is reflected in PBS3, and enters into the optical detection system which comprises the Hukou prism 7, the detection lens 8, and the hyperfractionation photodetector 9, and a record signal and a focus, and a tracking servo signal are detected, respectively. About this detection system, since it is not this invention and directly related, detailed explanation is omitted.
By the way, between the luminous flux diameters D of light spot diameter d narrowed down on the optical disc 6 with the object lens 5, and the optical beam which forms the light spot, when smaller than the opening diameter of the object lens 5, the relation of a following formula is realized by the luminous flux diameter D.
d**2 and k-lambda-f/D .... (1) here -- wavelength of lambda:optical beam f: -- spot diameter d is inversely proportional to the luminous flux diameter D of the optical beam which enters into the object lens 5 so that more clearly than the focal distance k:proportionality constant (1) type of the object lens 5. That is, big spot diameter d is obtained, so that the luminous flux diameter D of the optical beam which enters into the object lens 5 is reduced.
Drawing 5 is an explanatory view for explaining the relation of the luminous flux diameter of the optical beams 31 and 32 and the spot diameter of the light spot 21 and 22 which enter into the object lens 5 in Drawing 1.
Namely, according to this example, as already stated, the luminous flux diameter of the optical beam 32 for elimination, Since it is reduced to the same path as opening diameter D2 of the circular opening 42 with the spatial filter 40 as shown in Drawing 5 (a), By setting opening diameter D2 as a suitable size, as spot diameter d2 of the light spot 22 for elimination is shown in Drawing 5 (b), it can be enough made large to the PITSUTO width of record PITSUTO currently recorded on the recording track 6a. Therefore, a signal can erase and the remainder can be prevented enough.
Drawing 6 is an explanatory view for explaining the relation of the luminous flux diameter of the optical beams 31 and 32 and the spot diameter of the light spot 21 and 22 in case the shape of the opening 42 of the spatial filter 40 differs from Drawing 5.
As shown in Drawing 6 (a), the opening 42 of the spatial filter 40 is used as an ellipse type, If luminous flux diameter D2' corresponding to the direction of recording track 6a is made shorter than luminous flux diameter D2 corresponding to the radial direction of the optical disc 6, The light spot 22 for elimination can become in the direction of recording track 6a with long ellipse type light spot, as shown in Drawing 6 (b), and it can raise erasing performances more by the gradual-heating-and-colding effect.
There is no restriction in the shape of the opening 42 provided in the spatial filter 40, and a size, and the light spot 22 for elimination which has desired shape with arbitrary shape is obtained.
According to this example, again the optical beam 31 for record / reproduction and the optical beam 32 for elimination, It is not emitted from two semiconductor laser light sources which became independent like the former, As shown in Drawing 2, it is emitted from the one semiconductor laser light source 1 which comprises the two semiconductor laser light emitting devices 1a and 1b which approached on monotonous

[same], have been arranged and were fixed in the same case 1e, Then, by that of the composition irradiated on the optical disc 6 through the same optical system, and intermediary ****, it stops that the light spot 21 and 22 causes a relative location gap under the influence of heat, vibration, etc., and there is an advantage that high irradiation position stability can be obtained.
Drawing 7 is a sectional view showing the composition of the 2nd example of this invention typically.
In Drawing 7, the same number was given to the same component parts as the example of Drawing 1.
In this example, the spatial filter 40 which comprises the wavelength selectivity mirror surface 41 and the opening 42 is formed on the optical beam entrance plane of PBS3, as shown in Drawing 7. Thus, reduction of optic mark is attained by composite-izing the spatial filter 40 and other optics.
Drawing 8 is a sectional view showing the composition of the 3rd example of this invention typically.
In Drawing 8, the same number was given to the same component parts as the example of Drawing 1 and Drawing 7.
In this example, as shown in Drawing 8, the spatial filter 40 is fixed and united with the holder 10 with the object lens 5.
Namely, the focus actuator 12 and the tracking actuator 13 are controlled by the output signal of the photodetector 9 through the digital disposal circuit 11, The object lens 5 and the spatial filter 40 which are being fixed to the holder 10 and the holder 10 drive to one, an intermediary, an optical axis direction (z shaft orientations), and a tracking direction (x shaft orientations), and a focus and tracking control are performed by this.
Thus, since the relative position of the opening 42 of the spatial filter 40 and the object lens 5 is fixable by driving the object lens 5 and the spatial filter 40 to one, Change of the amount of KERARE of the optical beam 32 for elimination by movement of the object lens 5 (quantity of the light which does not enter into the object lens 5 among the optical beams 32 for elimination emitted from the spatial filter 40) can be lost.
Like the above example, it can arrange in the arbitrary optical paths of the semiconductor laser light source 1 to the object lens 5, and the spatial filter 40 can also be composite-ized with other optics.
Drawing 9 is a sectional view showing the composition of the 4th example of this invention typically.
In Drawing 9, the same numerals were given to the same component parts as the already described example.
the composition in which the optical beam 32 for elimination which the spatial filter 40 inclines, is arranged to the optical beams 31 and 32, and reflects the spatial filter 40 does not return to the semiconductor laser light source 1 in this example as shown in Drawing 9 -- intermediary ****. Such composition can protect generating of the laser noise by returned light.
Thus, inclined arrangement of the spatial filter 40 may be carried out at arbitrary angles to the optical beams 31 and 32. However, since wavelength selectivity changes with the incidence angles of an optical beam in this case in the wavelength selectivity mirror surface 41, it is necessary to perform a film design so that desired wavelength selectivity may be acquired to the optical beam of a predetermined incidence angle. It is necessary to design so that the light spot for elimination may make desired shape also about the shape of the opening 42.
Drawing 10 is a sectional view showing the composition of the 5th example of this invention typically. the --A [10] figure is an important section enlarged drawing of the optical disc surface in Drawing 10.
In Drawing 10, the same numerals were given to the same component parts as the already described example.
In this example, the reflected light beam from the optical disc 6 which reflected PBS3 reaches an optical detection system, after having an optical path bent by the mirror 14 for optical path changes.
In this example, the rising mirror 15 and the spatial filter 40 are composite-ized. That is, as shown in Drawing 11, the spatial filter 40 which comprises the wavelength selectivity mirror surface 41 and the circle die opening mouth 42 is formed on the reflector of the rising mirror 15. And as shown in a figure, the wavelength selectivity mirror surface 41 is established so that it may incline a

little in yz side to the reflector of the rising mirror 15.
Therefore, the central part 32a of the optical beam 32 which entered into the total luminous flux of the optical beam 31 and the opening 42 of the spatial filter 40 among the optical beam 31 for record / reproduction which entered into the spatial filter 40, and the optical beam 32 for elimination penetrates the spatial filter 40, and reflects it in the reflector of the rising mirror 15. On the other hand, the peripheral part 32b of the optical beam 32 which entered into the wavelength selectivity mirror surface 41 of the spatial filter 40 is reflected in the wavelength selectivity mirror surface 41. Since the wavelength selectivity mirror surface 41 inclines a little to the reflector of the rising mirror 15 at this time, ******** reflection of the optical beam 32b is carried out a little to the optical beams 31 and 32a at the circumferencial direction (y shaft orientations) of an optical disc.
As a result, on the recording track 6a of the optical disc 6. The light spot 21 for record / reproduction formed from the optical beam 31 for record / reproduction as shown in Drawing 12, A ********** exposure is carried out with the big light spot 22a for elimination of the spot diameter formed from the optical beam 32a for elimination, and the light spot 22b with large intensity of the surrounding ring part which adjoins it and is formed from the optical beam 32b for elimination and whose spot diameter is small. Therefore, at the time of elimination, this light spot 22a and 22b for elimination both irradiates with the recording track 6a with strong light intensity, and it eliminates by the temperature-up annealing effect.
By taking composition like this example, the light volume loss of the optical beam for elimination can be abolished, and efficient elimination can be performed.
Drawing 13 is a sectional view showing the composition of the 6th example of this invention typically.
In Drawing 13, the same numerals were given to the same component parts as the already described example.
In this example, spatial filter 40' consists of the wavelength selectivity mirror surface 43 and the total reflection mirror side 44, as shown in Drawing 14. Unlike the already described example, as shown in Drawing 15, reflectance is high at wavelength lambda1 of the optical beam 31 for record / reproduction, and the wavelength selectivity mirror surface 43 is intermediary **** with low reflectance at wavelength lambda2 of the optical beam 32 for elimination.
Therefore, since total luminous flux is reflected as for the optical beam 31 for record / reproduction and only the central part of the light flux which entered into the total reflection mirror side 44 is reflected by using spatial filter 40' as for the optical beam 32 for elimination, By making area of the total reflection mirror side 44 into a suitable size, the luminous flux diameter of the optical beam 32 for elimination can be reduced to arbitrary paths, and, as a result, the spot diameter of the light spot 22 for elimination can be expanded.
Thus, by using the spatial filter 40 with a reflection type, the luminous flux diameter of the optical beam 32 for elimination is reducible, bending an optical path. Therefore, it is possible to make the spatial filter 40 use also [mirror / a rising mirror or / for optical path changes], and reduction of part mark can be aimed at.
[Effect of the Invention]
According to this invention, with the easy composition about conventional 1 laser-beam HETSUDO only for record, and approximately said, the spot diameter of the light spot for elimination is made larger enough than record PITSUTO, a signal erases, and the remainder can be prevented, and instant rewriting of a signal is also attained.
The optical beam for record / reproduction and the optical beam for elimination, Since it is emitted from one semiconductor laser light source which comprises two or more semiconductor laser light emitting devices which approached, have been arranged and were fixed on monotonous [same] and glares on an optical disc through the same optical system, A relative location gap of each light spot generated under the influence of heat, vibration, etc. can be suppressed, and high irradiation position stability can be obtained.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
the [the sectional view in which Drawing 1 showed the composition of the 1st example of this invention typically, and] -- the important section enlarged drawing of an optical disc surface [in / inA / 1 / figure / Drawing 1]. The perspective view which Drawing 2 fractured a part of semiconductor laser light source in Drawing 1, and was shown, The graph which shows the wavelength dependency of the reflectance of a wavelength selectivity mirror surface [in / in the perspective view and Drawing 4 showing the composition of a spatial filter / in / in Drawing 3 / Drawing 1 / Drawing 3], An explanatory view for Drawing 5 to illustrate the relation of the luminous flux diameter of each optical beam and the spot diameter of light spot which enter into the object lens in Drawing 1, An explanatory view for Drawing 6 to illustrate the relation between the luminous flux diameter of each optical beam in case the shape of the opening of a spatial filter differs in Drawing 5, and the spot diameter of light spot, The sectional view in which Drawing 7 showed the composition of the 2nd example of this invention typically, the sectional view in which Drawing 8 showed the composition of the 3rd example of this invention typically, The sectional view in which Drawing 9 showed the composition of the 4th example of this invention typically, the sectional view in which Drawing 10 showed the composition of the 5th example of this invention typically, the -- the perspective view showing the composition of a rising mirror [in / in the important section enlarged drawing of an optical disc surface / in / inA / 10 / figure / Drawing 10 /, and Drawing 11 / Drawing 10], and a spatial filter, and Drawing 12 -- the -- the explanatory view showing the light intensity on the recording track 6a inA [10] figure. the graph which shows the wavelength dependency of the reflectance of a wavelength selectivity mirror surface [in / in the sectional view in which Drawing 13 showed the composition of the 6th example of this invention typically, the perspective view showing the composition of a spatial filter / in / in Drawing 14 / Drawing 13 /, and Drawing 15 / Drawing 14] -- it comes out.
Explanations of letters or numerals
1 .... A semiconductor laser light source, 1a, 1b .... A semiconductor laser light emitting device, 3 .... Polarization beam splitter, 5 .... An object lens, 6 .... An optical disc, 21 .... Light spot for record / playback, 22 [.... A spatial filter, 41, 43 / .... A wavelength selectivity mirror surface, 42 / .... An opening, 44 / .... Total reflection mirror side] .... The light spot for elimination, 31 .... The optical beam for record / reproduction, 32 .... The optical beam for elimination, 40, 40'
